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# MISSOULA FIRE SCIENCES LABORATORY: Documenting and Preserving the Past for the Future of Wildland Fire Research

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## **MISSOULA FIRE SCIENCES LABORATORY:**

**Documenting and Preserving the Past for the Future of Wildland Fire Research**

**JFSP Project No. 12-4-01-9**

**DATA ARCHIVING**

**FINAL REPORT**

**PI:** Kristine Lee, Deputy Program Manager of the Fire, Fuel, and Smoke Science Program and Director of the Fire Modeling Institute

**Co-PI:** Diane Smith, Environmental Historian/Post-Doctoral Researcher

**April 1, 2013**



## **ABSTRACT**

The Missoula Fire Sciences Laboratory's Documenting and Preserving the Past for the Future of Wildland Fire Research has 1) identified early Rothermel and Anderson research records from the 1960s, '70s, and '80s; 2) cataloged research data, correspondence, draft manuscripts, and photographs; 3) using archival-quality supplies, re-filed the materials in a secure storage area; 4) scanned and copied all slides and photo documentation discovered to date (more than 4500) to the Fire Lab's "O" drive; and 5) entered references to all catalog databases and photographs into the Metavist program. Research data and documentation discovered to date include one of the earliest Fire Physics Study Plans, fire behavior and model-development research plans for the 1970s and 1980s, and fire-spread model computations and research documentation from 1969. A series of multi-year large-fuel studies have also been cataloged and preserved.

## **BACKGROUND AND PURPOSE**

Not long after the Northern Forest Fire Laboratory (now the Missoula Fire Sciences Laboratory or “Fire Lab”) opened its doors in September 1960, scientists and engineers began documenting approximately 200 fires burned under controlled humidity, air velocity, and fuel moisture. In 1965, these early researchers presented their findings at the International Symposium of the Combustion Institute, in Cambridge, England (Anderson and Rothermel 1965). This research eventually led to the development of a model to predict wildland fire spread (Rothermel 1972). To this day, this model provides the foundation of the current suite of national fire-related systems, including BehavePlus, one of the most widely used computerized fire system in the U.S. It also served as the basic platform for the development of systems such as the National Fire Danger Rating System, Farsite, and the 21<sup>st</sup> century web-based Wildland Fire Decision Support System (WFDSS). Researchers at the time kept detailed research notes and, it turns out, extensive photographic documentation. To date, these materials have been stored in literally hundreds of boxes in the Fire Lab basement, which has experienced flooding in the past. Indeed, some of the files, photographs, and research records retrieved to date have been water damaged. Thus, this project has initiated an extensive, long-term archiving project to document and protect those records kept by the Fire Lab’s earliest researchers.

## **STUDY DESCRIPTION AND LOCATION**

The Missoula Fire Sciences Laboratory: Documenting and Preserving the Past for the Future of Wildland Fire Research project (or “Archiving Project”) has 1) identified early Rothermel and Anderson research records from the 1960s, ‘70s, and ‘80s related to early fire behavior and other research, stored in the basement of the Missoula Fire Sciences Laboratory; 2) cataloged research data, correspondence, draft manuscripts, and photographs; 3) using archival-quality supplies, re-filed the materials in a secure storage area; 4) scanned and copied all slides and photo documentation discovered to date (more than 4500 scans) to the Fire Lab’s “O” drive, and stored hard copies of slides, prints, and negatives in the temperature-stable archives; and 5) entered references to all catalog databases and photographs into the Metavist program.

## KEY FINDINGS

While the project set out to document early fire behavior research, the actual process of working through boxes of notes, data, reports, and photographic records has resulted in a much wider focus. For example, the Archiving Project has identified one of the earliest Fire Physics Study Plans (1967) and fire behavior and model-development research plans from the 1970s and 1980s for most senior researchers (Rothermel D-297). The Project has also documented and preserved live fuel moisture model development data and notes (1970s); Aerospace Corporation Fire Simulations (1970s); Fire Behavior Verification manuscript and comments (1981 and 1982); and several fire histories, including the Outlaw Fire (1974), Three Horn Fire and fire trial notes (1985), and Butte Fire manuscripts and interviews (1985) (Rothermel D-288).

Another box of materials (Rothermel D-292) included laboratory and *in situ* measurements of thermal properties of various fuels, and yet another (Rothermel D-299) included Fire Spread Model Computations and Research documentation from 1969, including hand-written modifications and computer printouts as the model was developed (1968 and 1969). All hard copies have been identified, catalogued, and stored in archival-quality files. An extensive collection of photo documentation and illustrations of lab-based research also has been uncovered and all slides have been scanned and stored.

One of the more unexpected findings has been a series of research study plans from most of the Fire Lab's leading scientists during the period of interest (Rothermel D-297). These include Fire Physics (1967), Fire Behavior Prediction (1975 and 1979), Crown Fire Models (1978), and TI-59 and the National Fire Danger Rating System development (1978). Study Plans from other research units have also been identified and preserved. As significantly, crown fire research from the 1970s has been identified, along with extensive field records, weather reports, photographs (~500), and subsequent research questions following the fires in Yellowstone (1988) (Rothermel D-295).

Rothermel's files from this period are complemented by Hal Anderson's research uncovered to date. Anderson, a physicist and collaborator with Rothermel on the development of early research-based models and reports, supervised a series of multi-year, large-fuel studies in the Fire Lab's burn chamber. These files include multiple observations in real time from researchers during the burn-out studies, data printouts, and photo documentation (Anderson D-234, D-238, D-242). The Anderson collection also includes extensive background information on instrumentation used in early testing, including schematics of the microprocessor circuit boards, operator's manuals, and wiring schematics.

Finding aids for research data and other records re-filed and stored to date are included at the end of this report as Appendices. Links to all the scanned photos are included in the Metavist records, also copied and attached.

## MANAGEMENT IMPLICATIONS

When fire historian Stephen Pyne visited the Fire Lab in July 2012 on a national research tour of Forest Service and other offices, he remarked on how well organized the fledgling archives were in comparison to other sites and offices he had visited. As he noted, much of the Forest Service's institutional memory – from fundamental research to management in the field – is tied up in personal experiences passed down through generations of researchers and foresters. While historians of science and the environment can benefit from these stories, historians, researchers, and practitioners alike rely on written evidence. Thus, the process of identifying, protecting, and documenting this early fire research has the potential to initiate new studies about the history of fire research, and how that history has contributed to current understanding about the role of fire. The basements and back offices of Forest Service and other agency offices probably hold similarly important files and research records. As more data and photographic records are identified and preserved, the Fire Lab's Archiving Project can serve as a national model of how to effectively protect *and value* the research and administrative records of the past for historians and scientists alike.

## RELATIONSHIP TO ONGOING WORK

The research records organized and documented to date contribute to more than written evidence of past research, however. As more records are identified and catalogued, they can provide a better understanding of the scientific basis of both current management tools as well as ongoing fundamental research, particularly in the area of fire physics. For example, not long after the Fire Lab opened its doors in September 1960, scientists and engineers began research into fire behavior. This research eventually led to the development of a model to predict wildland fire spread (Rothermel 1972). To this day, this early research provides the foundation of the current suite of national fire-related systems, including BehavePlus, one of the most widely used computerized fire system in the U.S. It also served as the basic platform for the development of systems such as the National Fire Danger Rating System, Farsite, and the 21<sup>st</sup> century web-based Wildland Fire Decision Support System (WFDSS).

But these models are not without their theoretical limitations. With advances in new technology and understanding of basic fire physics, fire researchers continue to build upon this early work. For example, wildland fire researchers still lack a coherent theory of fire spread, so scientists at the Fire Lab are investigating the basic physics of fire and what leads to the series of ignition needed for fire to spread. Having access to this early documentation (c. 1960-1970) will help Fire Lab and other wildland fire researchers understand the assumptions made as part

of the development of these early models, many of which are still in use today, as well as compare results from early combustion tests under varying conditions with current, ongoing research. Having access to a wealth of fire histories and field photographs can also help with current research on how wildlands change over time. This is of critical importance as researchers attempt to assess the future impacts of climate change and other stresses to the landscape.

### **FUTURE WORK NEEDED**

The Archiving Project has attempted to identify early Richard Rothermel and Hal Anderson fire behavior research and documentation, but literally hundreds of boxes of records from these and other researchers from the Fire Lab's earliest years still remain unopened and undocumented. Moreover, as others retire, more research records will be added to the basement storage area. For example, Pat Andrews, who recently retired, was a significant contributor to early fire behavior model and systems development, and her work should be preserved and added to the Rothermel and Anderson collections. As research into the collection has progressed, additional important files have been discovered but, as of yet, been left unexplored and undocumented. For example, Fire Lab researcher Bob Mutch was instrumental in the Forest Service change of policy in allowing some fires to burn in wilderness areas. His research and records (including fuel samples taken from the White Cap research area in the early 1970s) are still stored in the basement where they, too, are subject to moisture damage. Hopefully, this project can continue to work through the wealth of data and fire research history stored in the Fire Lab basement.

## DELIVERABLES TABLE

<b><i>Proposed</i></b>	<b><i>Delivered</i></b>	<b><i>Status</i></b>
Identify Research Data	Eleven boxes of research notes, photographs, and reports have been identified to date, along with computer printouts and binders/boxes of slides and other supportive documentation.	Phase I complete.
Conduct QA/QC on Data	After a review of materials, including extensive 40- to 50-year-old photo documentation, the PI agreed that protection of the photographs and slides should be the project's highest priority. (Color prints and slides have a very limited "shelf life.")	Phase I complete.
Scan Relevant Documentation	More than 4500 slides, Polaroids, and other photographic documentation and presentation data have been scanned. All scans have been stored on the internal "O" drive and will be copied to CD as part of this report.	Phase I complete.
Describe and Enter Data in Metavist	Eleven Metavist files documenting the research uncovered to date have been created (see attached). In addition, extensive "finding aids" have been created, cataloging the hundreds of files created as part of this effort (also attached).	Phase I complete.



**Appendix I:**

**RICHARD ROTHERMEL COLLECTION  
(1961-1994)**

*(in progress)*

**April 1, 2013**

**EndNote reference: D-288**

***SCANNED PHOTOS:***

Aerospace research photos (1973) (some water damaged and not scanned)

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\Box D288\Firebrand study - Muraszew aerospace corporation coop agreement

Butte Fire photos (color and black and white prints and negatives)

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\Box D288\A Series Butte Fire

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\Box D288\B Series Butte Fire

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\Box D288\Folder 1

FOLDER 1: black and white scans from lab, n.d.

***FILES:***

**AEROSPACE CORPORATION RESEARCH (1973)**

Aerospace Corporation Fire Simulation

Firebrand-Generated Spot Fires

**BUTTE FIRE (1985)**

Butte Fire photos (color and black and white prints and negatives) and un-keyed captions

Butte Fire Shelter Incident, including maps

“Butte Fire: 73 Survive in Fire Shelters,” Rothermel and Mutch draft 1/30/86 and related correspondence/reviews

Butte Fire paper comments

“Behavior of the Life Threatening Butte Fire”, Rothermel and Mutch, with BEHAVE inputs and B&w photos and comments

Butte Fire Miscellaneous: notes, interviews, etc.

**FUEL MOISTURE MODEL (1970s)**

Live Fuel Moisture Plots (c 1960s)

Live Fuel Moisture Model (1973-75) (includes moisture printouts)

Live Fuel Moisture Misc. (1975-1977) (Includes copy of Derivation and Testing of a Soil by Mount)

Live Fuel Moisture Model (1975-77) (Includes research notes and paper)

Fuel Properties (c 1978) (Includes notes and data)

**COHEN, WARREN, ET AL. MANUSCRIPTS**

Cohen, Warren (unpublished) manuscript, “Probably Influence of Extreme Temperature on Water Transport in Trees and Shrubs” (1987)

Cohen, Warren, manuscript, “Water Uptake of Subalpine Conifer Branches during Heating” (1987)

Cohen, Warren, manuscript “Influence of Abnormally High Temperatures on the Transport of Water by Lodgepole Pine Branches,” plus correspondence (1988)

#### FIRE BEHAVIOR (1980s)

- Fire Behavior Verification (1981)
- Fire Behavior Verification (1982) (minor water damage)
- BEHAVE printouts (tractor paper), May and September 1985

#### FIRE HISTORIES

- Outlaw Fire (1974)
- Three Horn Fire (1982-86)
- [Three Horn?] Fire Trial Notes (1985)
- Lake Mountain Fire (1985) (shelter deployment)
- Sourdough and Owl Creek Fires (1985)
- Lochsa Face Prescribed Fires (1989)

#### MISCELLANEOUS

- Aerial Fuel Complex by 5-ft. Increments of Lodgepole pine (1965), includes research from S.J. Muraro, Victoria BC
- Wind Tunnel Model, Bibliography, etc. (1983)
- Rothermel and Susott, "Natural Resistance of Conifer Trees to Fire by Accelerated Water Transpiration," DRAFT manuscript (c 1988)
- Bonnicksen, Thomas, "Fire Gods and Federal Policy" [Yellowstone] article and comments (1989)
- deMestre, N.J., "Uniform Propagation of a Planar Fire Front without Wind," manuscript with notes (1989)
- deMestre, N.J., "Shielded Radiation" comments (1989)
- Misc. file

**EndNote reference: D-292**

**SCANNED PHOTOS:**

Series of lightning graphs and 71 black and white photographs from 9-12-68 (*kept in original binder in box D-292*):

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\  
Box D292\1st binder

**FILES:**

Original layout (including photos, diagrams, graphs etc.) “How to Predict Spread and intensity of Forest and Range Fires” (1983) – *kept in box D-292*

**CROWN FUEL LOADS**

Crown Fuel Loads Terminology and Calculations (n.d. – 1991?)

Crown Fuel Loads (white pine, ponderosa pine, subalpine pine, etc.) (n.d. – 1991?)

Misc. Crown Fuel Data (1990-1991)

Misc. graphs, measurements, calculations (crown fuel?) (n.d.)

**WEATHER DATA**

Priest River Weather Data 1911-1977

Priest River Weather Data, including 50-year averages

Meadow Creek, Nez Perce National Forest Weather Data (1969, 1974)

**THERMAL PROPERTIES – Lab and *in situ* measurements, 1982-83**

Styrofoam (1982-1983)

Dry Sand (1982-1983)

Saturated Sand (1982-1983)

Idaho Ash in lab (1982-1983)

Idaho Ash *in situ* (1982-1983)

Dry Bulk Density Measurements (1982-1984)

Moose Creek Moisture/Fuel Loading (1973-1975)

“Flame Shielded Fire Propagation” draft by de Mestre, Rothermel, Wilson and Albini (1988)

Fuel Model (7) Corrections (1990)

**EndNote reference: D-295**

***SCANNED PHOTOS:***

**YELLOWSTONE NATIONAL PARK PHOTOGRAPHS (1988) – Two binders of slides:**

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\  
Box D295\Slides Yellowstone Fire 1988 binder #1  
O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\  
Box D295\Slides Yellowstone Fire 1988 Binder #2

***FILES:***

**YELLOWSTONE NATIONAL PARK FIRES (1988)**

Real-time Moisture Measurements, including “Observation and Prediction of Fuel Moisture During  
1988 Yellowstone Fires,” by Hartford and Rothermel ( 1990)  
North Fork and Madison Junction Moisture Data (August 1988)  
Fuel Moisture Data, including from past YNP fires (1988)  
Fuel Moisture Data, North Fork Fire (August 1988)  
Fuel Moisture Data Collection, east of West Yellowstone, Schuette and Hartford transcription of taped  
records kept in real time (August 25-27, 1988)  
Fire Behavior Projections (August 2, 1988)  
BEHAVE Calculations for August 25, 1988 (November 1990)  
BEHAVE Calculations for August 25-27, 1988, North Fork Fire  
YNP North Fork/Wolf Lake Fires, misc. plus maps (August 1988)  
Fire Behavior Calculations, plus glossary (1988)  
Fire Behavior Situation Report no. 11, September 14, 1988 (plus glossary)  
Fire Severity Data (July 1988)  
Fire Severity Printouts – All fires (1988)  
Grant Village Burnout Plan  
Weather Reports, July 27 – September 19, 1988  
Summary of Weather Data, June 14 – October 1, 1988  
I.R. flights (Sept 1988)  
Preliminary Report YNP Fires (Oct 1988)  
Research Meeting at Montana State University (Oct 1988)  
Impact of fires on soils, Grant Station (1989)  
Problem Analysis and Misc. (c 1989)  
Post-Fire Proposals (1989)  
“Fuel Moisture as Measured and Predicted,” Hartford and Rothermel (1990) with comments  
Research Response (1991)  
Oxygen Consumption, Post-Fire Assessment (1991)  
Historical YNP fires, 1931-1990 (map)  
Long-Range Fire Predictions (Rothermel manuscript – n.d.)  
Misc. YNP Articles, etc.-  
Misc. YNP including command updates (Sept 1988)  
Misc. YNP Calculations, including Little Firehole Watershed  
Misc. YNP notes and weather data (1988)  
BEHAVE in Short-Leaf Pine (1988)  
O’Keefe Creek Burn (1980)  
Crown Fire Manuscript re 1985 fire season (1988)

Misc. Research notes etc (crown fires?) (1988)  
Research questions re Moisture in Living Plants

FIREMOD Inputs (n.d.)

Fayette Fire (1988)

Lowman Complex Fire (1989)

Helicopter Infrared (1991)

Fire Behavior and Misc. reports (in Chinese) (n.d.)

**EndNote reference: D-297**

**SCANNED PHOTOS:**

TI-59 and misc. photos (1978)

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\Box D297

**FILES:**

**STUDY PLANS**

Fire Physics – Anderson (1967)

Predicting Flame Retardant Concentration – Philpot (1972)

Slash Fuels - Frandsen (1974)

Predicting Slash Depth – Brown et al. (1975)

Predicting Slash Depth Study Plan (1975)

Fire Behavior Prediction – Rothermel (1975)

Crown Fire Model – Albini (1978)

Crown Fire Model – Albini (1978)

TI-59/NFDRS – Deeming (1978)

TI-59 and misc. photos (1978)

Fire Behavior – Rothermel (1979)

Hilbruner Proposed Research (1981)

Project Work Plan Overview ( 1987)

**STUDY PLANS OTHER UNITS**

Study Plans for other Units (1980-1985)

Fire Danger Rating and Smoke Problem Analysis - SE region (1982)

Fuel, Fire and Emissions Description – SE Region (1983)

**RESEARCH CORRESPONDENCE**

Research Correspondence (1987-1990), including “enhancing Forest-based Economies in Rural America” (1989); Rothermel transcript re Mink Creek Fire in Bridger-Teton wilderness, near Yellowstone (1988); “Intermountain Region Forest Plan Implementation (1988)

Research Correspondence (1991), including Ralph Nelson “The Stationary State Entropy Gradient in Wood Containing only Bound Water” (1991); “Proposed Research Initiatives: Forest Fire and Atmospheric Sciences Research” (November 7, 1985).

**MANUSCRIPT REVIEWS**

1988 (including YNP articles)

1989

1993

1994

Technical Committee Meetings (1974-1999)

Summary of Basic Fire Spread calculations and overheads (n.d.)

Surface/Volume Calculations and Overhead

“Below Cost Timber Sales” (1988)

Foreign Visitors (1988-1991)

Italian Fire Protection (1991)

“Archived” Documents (1989-1993), including Rothermel, “Thoughts on an Integrated System,” 1990 (draft mss); integrated fire behavior/fire danger system notes, 1990; “Natural Resistance of Conifer Trees” drafts; “Methods of Supporting a Decision to Let a Prescribed Fire Burn or to Suppress It,” n.d.; “conceptualization of How to Represent Fire Potential in the Integrated System,” n.d.

**EndNote reference: D-299**

PHOTO COLLECTION (close to 1500 scans, including research drawings, illustrations, slide shows, etc.)

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\Box D299

D-299 includes photos from several fires (including Alaska fires, 1977; Pattee Canyon, 1977; Big Salt River, 1977; Glacier, 1979; O'Keefe Creek, 1979; Grant Creek, 1979; Moose Creek, 1979; Rock Creek, 1980; Muldoon fire, 1981; Custer, 1981; Reno fire 1981; Lavelle Creek, 1982; Yosemite, 1983; Seeley Lake, 1984; North Hills fire, 1984; Canyon Creek 1988; Thompson Creek, 1991). It also includes early (c 1960s) research photos and graphs, etc. and other field photos.

**FIRE SPREAD MODEL COMPUTATIONS AND RESEARCH DOCUMENTATION**

1968 Experimental computation (1969)

Experimental computations (1969)

Fire Spread Model Revisions (October 1, 1969)

Fire Spread Model Modifications to Heterogeneous Model (April 16 and October 8, 1969)

**FIRE SPREAD MODEL PRINTOUTS/ DATA RUNS (stored on shelves with other data runs)**

11-25-68

7-03-69

9-10-69

12-2-69

**EndNote reference: NONE**

**(Research slide collection in binder – should be re-packaged)**

Slides of lab research and some graphs, 1962-1972:

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\Lab Expt.  
& Data M. Binder



## Metadata: D-288 (Rothermel)

- [Identification Information](#)
- [Metadata Reference Information](#)

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### Identification Information:

*Citation:*

*Citation Information:*

*Originator:* Rothermel, Richard et al.

*Publication Date:* Unpublished material

*Title:* Richard Rothermel Collection (1961-1994)

*Geospatial Data Presentation Form:* database

*Series Information:*

*Series Name:* D-288, Fire Sciences Archives

*Issue Identification:*

*Description:*

*Abstract:*

Collection of Richard Rothermel's papers, reports, and photographs. D-288 includes files on Butte Fire (1985) and Fire Shelter Incident; Aerospace Corporation Research (1973); Early Fuel Moisture Model research (1970s); and early fire behavior verification research, including research printouts. D-288 includes more than 100 scanned slides available here:

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rotherme  
l\Box D288\A Series Butte Fire

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rotherme  
l\Box D288\B Series Butte Fire Seven unidentified black and white prints:

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rotherme  
l\Box D288\Firebrand study - Muraszew aerospace corporation coop agreement

*Purpose:*

Preservation of research notes and photo documentation - fire behavior and other research

*Supplemental Information:*

For access to scanned photographs and other data, contact Kris Lee (kristinelee@fs.fed.us) or Diane Smith (dianemsmith@fs.fed.us).

*Time Period of Content:*

*Time Period Information:*

*Range of Dates/Times:*

*Beginning Date:* Unknown

*Ending Date:* Unknown

*Currentness Reference:*

ground condition

*Status:*

*Progress:* Planned

*Maintenance and Update Frequency:* As needed

*Keywords:*

*Theme:*

*Theme Keyword Thesaurus:* None

*Theme Keyword:* wildland fire research, fire shelter deployment, Butte Fire, Aerospace Corporation research, Richard Rothermel

*Access Constraints:* None

*Use Constraints:*

None

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*Metadata\_Reference\_Information:*

*Metadata\_Date:* 20121009

*Metadata\_Contact:*

*Contact\_Information:*

*Contact\_Person\_Primary:*

*Contact\_Person:* Diane Smith

*Contact\_Organization:* Missoula Fire Sciences Laboratory

*Contact\_Address:*

*Address\_Type:* mailing and physical

*Address:* 5775 W US Highway 10

*City:* Missoula

*State\_or\_Province:* MT

*Postal\_Code:* 59808-9361

*Contact\_Voice\_Telephone:* 406-829-6957

*Metadata\_Standard\_Name:* FGDC Biological Data Profile of the Content Standard for Digital Geospatial Metadata

*Metadata\_Standard\_Version:* FGDC-STD-001.1-1999

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## Metadata: D-292 (Rothermel)

- [Identification Information](#)
- [Metadata Reference Information](#)

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### Identification Information:

*Citation:*

*Citation Information:*

*Originator:* Rothermel, Richard et al.

*Publication Date:* Unpublished material

*Title:* Richard Rothermel Collection (1961-1994)

*Geospatial Data Presentation Form:* database

*Series Information:*

*Series Name:* D-292, Fire Sciences Archives

*Issue Identification:*

*Description:*

*Abstract:*

Documentation of thermal properties of various materials in lab and in situ (1982-83), fuel model (7) corrections (1990), crown fuel research documentation, and weather data, including Priest River (1911-1977). Includes original layout of "How to Predict Spread and Intensity of Forest and Range Fires" (1983), and series of 71 graphs and photographs of lightning (1968), stored in D292 and available here:  
O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\Box D292\1st binder

*Purpose:*

Preservation of research notes and photo documentation - fire behavior and other research

*Supplemental Information:*

For access to scanned photographs and other data, contact Kris Lee (kristinelee@fs.fed.us) or Diane Smith (dianemsmith@fs.fed.us)

*Time Period of Content:*

*Time Period Information:*

*Range of Dates/Times:*

*Beginning Date:* Unknown

*Ending Date:* Unknown

*Currentness Reference:*

ground condition

*Status:*

*Progress:* Planned

*Maintenance and Update Frequency:* As needed

*Keywords:*

*Theme:*

*Theme Keyword Thesaurus:* None

*Theme Keyword:* Rothermel, crown fuel research, Priest River, lightning documentation

*Access Constraints:* None

*Use Constraints:*

None

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*Metadata\_Reference\_Information:*

*Metadata\_Date:* 20121003

*Metadata\_Contact:*

*Contact\_Information:*

*Contact\_Person\_Primary:*

*Contact\_Person:* Diane Smith

*Contact\_Organization:* Missoula Fire Sciences Laboratory

*Contact\_Address:*

*Address\_Type:* mailing and physical

*Address:* 5775 W US Highway 10

*City:* Missoula

*State\_or\_Province:* MT

*Postal\_Code:* 59808-9361

*Contact\_Voice\_Telephone:* 406-829-6957

*Metadata\_Standard\_Name:* FGDC Biological Data Profile of the Content Standard for Digital Geospatial Metadata

*Metadata\_Standard\_Version:* FGDC-STD-001.1-1999

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## Metadata: D-295 (Rothermel)

- [Identification Information](#)
- [Metadata Reference Information](#)

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### Identification Information:

*Citation:*

*Citation Information:*

*Originator:* Rothermel, Richard et al.

*Publication Date:* Unpublished material

*Title:* Richard Rothermel Collection (1961-1994)

*Geospatial Data Presentation Form:* database

*Series Information:*

*Series Name:* D-295, Fire Sciences Archives

*Issue Identification:*

*Publication Information:*

*Publication Place:* n/a

*Publisher:*

*Description:*

*Abstract:*

Research notes, print-outs, weather data, and photos, mostly focused on Yellowstone National Park fires. Files include 1985-1987 crown fire manuscripts, and 1988 real-time moisture measurements, fire behavior calculations, fire severity data, and follow-up research proposals and problem analysis. Approximately 500 photo documentation of 1988 YNP (two binders of slides):

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\Box D295\Slides Yellowstone Fire 1988 binder #1

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\Box D295\Slides Yellowstone Fire 1988 Binder #2

*Purpose:*

Preservation of research notes and photo documentation -- fire behavior and other research

*Supplemental Information:*

For access to scanned photographs and other data, contact Kris Lee (kristinelee@fs.fed.us) or Diane Smith (dianemsmith@fs.fed.us)

*Time Period of Content:*

*Time Period Information:*

*Range of Dates/Times:*

*Beginning Date:* 1988

*Ending Date:* 1989

*Currentness Reference:*

ground condition

*Status:*

*Progress:* Planned

*Maintenance and Update Frequency:* As needed

*Keywords:*

*Theme:*

*Theme Keyword Thesaurus:* None

*Theme Keyword:* Yellowstone National Park, crown fire research, Richard Rothermel

*Access Constraints:* None

*Use Constraints:*

None

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---

*Metadata\_Reference\_Information:*

*Metadata\_Date:* 20121002

*Metadata\_Contact:*

*Contact\_Information:*

*Contact\_Person\_Primary:*

*Contact\_Person:* Diane Smith

*Contact\_Organization:* Missoula Fire Sciences Lab

*Contact\_Address:*

*Address\_Type:* mailing and physical

*Address:* 5775 W US Highway 10

*City:* Missoula

*State\_or\_Province:* MT

*Postal\_Code:* 59808-9361

*Contact\_Voice\_Telephone:* 406-829-6957

*Metadata\_Standard\_Name:* FGDC Biological Data Profile of the Content Standard for Digital Geospatial Metadata

*Metadata\_Standard\_Version:* FGDC-STD-001.1-1999

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## Metadata: D-297 (Rothermel)

- [Identification Information](#)
- [Metadata Reference Information](#)

---

### Identification Information:

*Citation:*

*Citation Information:*

*Originator:* Rothermel, Richard et al.

*Publication Date:* Unpublished material

*Title:* Richard Rothermel Collection (1961-1994)

*Geospatial Data Presentation Form:* database

*Series Information:*

*Series Name:* D297-Fire Sciences Archives

*Issue Identification:*

*Publication Information:*

*Publication Place:* n/a

*Publisher:*

*Description:*

*Abstract:*

Collection includes original research correspondence (1987-1991), research questions and analysis and work study plans including Fire Physics Study Plan (1967), early crown fire modeling (Albini, 1978), and work on the TI-59, including related photos:

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\Box D297 Also includes two sets of notes and overheads on fire spread and surface/volume calculations.

*Purpose:*

Preservation of research notes and photo documentation - fire behavior and other research.

*Supplemental Information:*

For access to scanned photographs and other data, contact Kris Lee (kristinelee@fs.fed.us) or Diane Smith (dianemsmith@fs.fed.us)

*Time Period of Content:*

*Time Period Information:*

*Range of Dates/Times:*

*Beginning Date:* Unknown

*Ending Date:* Unknown

*Currentness Reference:*

ground condition

*Status:*

*Progress:* Planned

*Maintenance and Update Frequency:* As needed

*Keywords:*

*Theme:*

*Theme Keyword Thesaurus:* None

*Theme Keyword:* wildland fire research, TI-59, crown fire research, Rothermel, Philpot, Albini

*Access Constraints:* None

*Use Constraints:*

None

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*Metadata\_Reference\_Information:*

*Metadata\_Date:* 20121003

*Metadata\_Contact:*

*Contact\_Information:*

*Contact\_Person\_Primary:*

*Contact\_Person:* Diane Smith

*Contact\_Organization:* Missoula Fire Sciences Lab

*Contact\_Address:*

*Address\_Type:* mailing and physical

*Address:* 5775 W US Highway 10

*City:* Missoula

*State\_or\_Province:* MT

*Postal\_Code:* 59808-9361

*Contact\_Voice\_Telephone:* 406-829-6957

*Metadata\_Standard\_Name:* FGDC Biological Data Profile of the Content Standard for Digital Geospatial Metadata

*Metadata\_Standard\_Version:* FGDC-STD-001.1-1999

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## Metadata: D-299 (Rothermel)

- [Identification Information](#)
- [Metadata Reference Information](#)

---

### *Identification Information:*

*Citation:*

*Citation Information:*

*Originator:* Rothermel, Richard

*Publication Date:* Unpublished material

*Title:* Richard Rothermel Collection (1961-1994)

*Geospatial Data Presentation Form:* database

*Series Information:*

*Series Name:* D-299, Fire Sciences Archives

*Issue Identification:*

*Description:*

*Abstract:*

D-299 includes 30+ boxes of misc. slides (approximately 900 images) from the Rothermel Collection, including Canyon Creek Fire 84, Dunham Fire 88, Pattee Canyon 77, Yosemite 83, Fire Spread slides, misc. illustrations, and Fire Scan photos. Scans are available here:

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\Box D299 Also includes original 1968-69 notes and printouts for original Rothermel Fire Spread Model, c. 1968 - 1969. NOTE: large tractor feed printouts stored on archive shelf with other printouts.

*Purpose:*

Preservation of research notes and photo documentation of fire behavior and other research.

*Supplemental Information:*

For access to scanned photographs and other data, contact Kris Lee (kristinelee@fs.fed.us) or Diane Smith (dianemsmith@fs.fed.us)

*Time Period of Content:*

*Time Period Information:*

*Range of Dates/Times:*

*Beginning Date:* 1968

*Ending Date:* 1969

*Currentness Reference:*

ground condition

*Status:*

*Progress:* Planned

*Maintenance and Update Frequency:* As needed

*Keywords:*

*Theme:*

*Theme Keyword Thesaurus:* None

*Theme Keyword:* Fire Spread Model, Richard Rothermel, Canyon Creed Fire, Dunham Fire, Pattee Canyon fire, Yosemite fire, Fire Scan

*Access Constraints:* None

*Use Constraints:*

None

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---

*Metadata\_Reference\_Information:*

*Metadata\_Date:* 20121002

*Metadata\_Contact:*

*Contact\_Information:*

*Contact\_Person\_Primary:*

*Contact\_Person:* Diane Smith

*Contact\_Organization:* Missoula Fire Sciences Lab

*Contact\_Address:*

*Address\_Type:* mailing and physical

*Address:* 5775 W US Highway 10

*City:* Missoula

*State\_or\_Province:* MT

*Postal\_Code:* 59808-9361

*Contact\_Voice\_Telephone:* 406-829-6957

*Metadata\_Standard\_Name:* FGDC Biological Data Profile of the Content Standard for Digital Geospatial Metadata

*Metadata\_Standard\_Version:* FGDC-STD-001.1-1999

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## Metadata: Notebook of Slides (no endnote ref) (Rothermel)

- [Identification Information](#)
- [Metadata Reference Information](#)

---

### Identification Information:

*Citation:*

*Citation Information:*

*Originator:* Rothermel, Richard et al.

*Publication Date:* Unpublished material

*Title:* Richard Rothermel Collection

*Geospatial Data Presentation Form:* multimedia presentation

*Series Information:*

*Series Name:* D-Slide\_Notebook Fire Sciences Archives

*Issue Identification:*

*Publication Information:*

*Publication Place:* n/a

*Publisher:*

*Description:*

*Abstract:*

Collection of 100+ slides documenting lab research from 1962-1972. Currently stored in original binder and available here:

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Rothermel\Lab Expt. & Data M. Binder

*Purpose:*

Preservation of research notes and photo documentation - fire behavior and other research

*Supplemental Information:*

For access to scanned photographs and other data, contact Kris Lee (kristinelee@fs.fed.us) or Diane Smith (dianemsmith@fs.fed.us)

*Time Period of Content:*

*Time Period Information:*

*Range of Dates/Times:*

*Beginning Date:* Unknown

*Ending Date:* Unknown

*Currentness Reference:*

ground condition

*Status:*

*Progress:* Planned

*Maintenance and Update Frequency:* As needed

*Keywords:*

*Theme:*

*Theme Keyword Thesaurus:* None

*Theme Keyword:* wildland fire research, Richard Rothermel, Hal Anderson

*Access Constraints:* None

*Use Constraints:*

None

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*Metadata\_Reference\_Information:*

*Metadata\_Date:* 20121003

*Metadata\_Contact:*

*Contact\_Information:*

*Contact\_Person\_Primary:*

*Contact\_Person:* Diane Smith

*Contact\_Organization:* Missoula Fire Sciences Lab

*Contact\_Address:*

*Address\_Type:* mailing and physical

*Address:* 5775 W US Highway 10

*City:* Missoula

*State\_or\_Province:* MT

*Postal\_Code:* 59808-9361

*Contact\_Voice\_Telephone:* 406-829-6957

*Metadata\_Standard\_Name:* FGDC Biological Data Profile of the Content Standard for Digital Geospatial Metadata

*Metadata\_Standard\_Version:* FGDC-STD-001.1-1999

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**Appendix II:**  
**HAL ANDERSON COLLECTION**  
**(1961- )**

*(in progress)*

**April 1, 2013**

**EndNote reference: D-234**

***SCANNED PHOTOS: (1982-84)***

Large fuel study –photos documenting studies (1982-83)

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive  
\_project\Anderson\Box D234\LargeFuelStudy\_1982\_83

Large fuel study – photos documenting studies (1984)

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive  
\_project\Anderson\Box D234\LargeFuelStudy\_1984

***FILES:***

Setup of Polycorder for Test Burns (1983)

Large fuel study (4) -- 11/24/1982 (water damage)

Large fuel study (5) – 12/13/1982 (water damage)

Large fuel study (1) – 1/28/1983 (water damage)

Large fuel study (2) – 5/17/1984 (water damage)

Large fuel study (3) -- 5/23/1984 (water damage)

Large fuel study (4) -- 5/16/1984 (water damage)

Large fuel study (5) – 5/24/1984 (water damage)

Large fuel study (6) -- 7/30/1985 (water damage – some notes lost)

Burn Out Study Data - 1985

**EndNote reference: D-236**

***SCANNED PHOTOS: (1981)***

Fuel Model example photos with notes when available (288 total)

(photos and notes stored with photo boxes – D-236)

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive  
\_project\Anderson

***OVERHEADS: (n.d.)***

Crown Fire Northern Rockies

(stored with photo boxes – D-236)

***HANGING FOLDERS:***

Ball Operator's Manual, Field Data Stations (c. 1971)

Ball Instrumentation Info (c 1975)

Ball Instrumentation/Data Processor, Blueprints, etc. (1975)

***Negatives*** – Microprocessor schematics circuit boards (1975)

Ball Instrumentation Wiring Schematics, etc. (1978)

Lubrecht Management Objectives , esp. bark beetles (c. 1976)

Fuel Moisture Data (1988-1989)

***FILES:***

Remote Radiation Signal Conditioning, wiring (n.d.)

Ball Data Processing (1978)

Scan Rate Select Board (handwritten) Operating Instructions (n.d.)

Fuel Model Descriptions (1980)

Anderson Fuel Model Paper drafts (1979)

**EndNote reference: D-238**

***SCANNED PHOTOS (1983-86)***

***Large Fuel Study Photos 1983:***

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive  
\_project\Anderson\BoxD238\LgFuelStudy\_1983--3T17-1\_3T17-2\_3T17-3

***Large Fuel Study Photos 1985:***

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive  
\_project\Anderson\BoxD238\LgFuelStudy\_1985\_PP-7\_PP-8\_PP-9\_PP-10\_DF-5-1\_DF-  
5-2

***Large Fuel Study Photos 1986:***

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive  
\_project\Anderson\BoxD238\LgFuelStudy\_1986\_PP-13

***FILES (1983)***

Large fuel study (3T-17-1) – 6/14/1983 (water damage)  
+ slides  
Large fuel study (3T-17-2) – 6/15/1983 (water damage)  
+ slides  
Large fuel study (3T-17-3) – 6/16/1983 (water damage)  
+ slides

***FILES (1985):***

Large fuel study (PP-7) -- 8/27/1985 (water damage)  
Large fuel study (PP-8) -- 9/24/1985 (water damage)  
Large fuel study (PP-9) -- 10/1/1985 (water damage)  
Large fuel study (PP-10) -- 8/22/1985 (water damage)  
Large fuel study (DF-5-1) -- 10/24/1985 (water damage)  
Large fuel study (DF-5-2) -- 10/29/1985 (water damage)

***FILES (1986):***

Large fuel study (LP-7) -- 5/22/1986 (water damage)  
Large fuel study (PP-13) -- 6/24/1986 (water damage)  
Large fuel study (PP-12) – 6/26/1986 (water damage)  
Large fuel study (SF - 6) – 7/10/1986 (water damage)  
Large fuel Study (LP-4-2) – 7/16/1986 (water damage)



**EndNote reference: D-241**

***SCANNED PHOTOS: (1985)***

Burn Out Study

(two binders of slides on shelves – D-241)

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive  
\_project\Anderson\BoxD241\_BurnOut\_Study1985

***FILES: (c. 1989)***

Burnout Data

(three printouts stored in legal-sized box on shelves)

**EndNote reference: D-242**

***SCANNED PHOTOS: (1982-1986)***

Burn Out Study – NOTE: some slides very dark

(four binders of slides on shelves – D-242)

O:\RD\R

MRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\  
Anderson\Box D242\_BurnoutStudy\_4\_binders\_1982

***FILES:***

Report on the National Fire Behavior Research Conference, March 18-20, 1980, Boise, ID

Electrical Layout of Power Arc Control System, Dec 6, 1983 (with 7 Polaroids of circuitry etc. – Not Scanned)

Large Fuel Study (LP-4-1) – 7/9/1985 (water damage) (two Polaroids – not scanned)

Large Fuel Study (HEA-LP-5-1) – 7/11/1985 (water damage) (two Polaroids – not scanned)

Large Fuel Study (HEA-LP-6-1) – 10/31/1985 (water damage) (three Polaroids not scanned)

Large Fuel Study (HEA-SF-3-1) – 10/3/1985 (water damage) (three Polaroids not scanned)

Large Fuel Study (HEA – SF – 5-1) – 8/1/1985 (water damage) (four Polaroids not scanned)

## Metadata: D-234 (Anderson)

- [Identification Information](#)
- [Metadata Reference Information](#)

---

### *Identification\_Information:*

*Citation:*

*Citation\_Information:*

*Originator:* Anderson, Hal

*Publication\_Date:* Unpublished material

*Title:* Hal Anderson Collection

*Geospatial\_Data\_Presentation\_Form:* database

*Series\_Information:*

*Series\_Name:* D-234, Fire Sciences Archive

*Issue\_Identification:*

*Description:*

*Abstract:*

Collection of notes, data, and printouts for a series of large-fuel studies conducted in the early 1980s. This box has been water damaged throughout, however, most notes, data, etc. are still legible. D-234 includes 19 scanned Polaroid photos documenting the test burns:

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Anderson\Box D234\LargeFuelStudy\_1982\_83

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Anderson\Box D234\LargeFuelStudy\_1984

*Purpose:*

Preservation of research notes and photo documentation of early fire research

*Supplemental\_Information:*

For access to scanned photographs and other data, contact Kris Lee ([kristinelee@fs.fed.us](mailto:kristinelee@fs.fed.us)) or Diane Smith ([dianemsmith@fs.fed.us](mailto:dianemsmith@fs.fed.us)).

*Time\_Period\_of\_Content:*

*Time\_Period\_Information:*

*Range\_of\_Dates/Times:*

*Beginning\_Date:* Unknown

*Ending\_Date:* Unknown

*Currentness\_Reference:*

ground condition

*Status:*

*Progress:* Planned

*Maintenance\_and\_Update\_Frequency:* As needed

*Keywords:*

*Theme:*

*Theme\_Keyword\_Thesaurus:* None

*Theme\_Keyword:* wildland fire research, burn studies, large fuels, Hal Anderson, Missoula Fire Sciences Lab

*Access\_Constraints:* None

*Use\_Constraints:*

None

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*Metadata\_Reference\_Information:*

*Metadata\_Date:* 20130131

*Metadata\_Contact:*

*Contact\_Information:*

*Contact\_Person\_Primary:*

*Contact\_Person:* Diane Smith

*Contact\_Organization:* Missoula Fire Sciences Laboratory

*Contact\_Address:*

*Address\_Type:* mailing and physical

*Address:* 5775 W US Highway 10

*City:* Missoula

*State\_or\_Province:* MT

*Postal\_Code:* 59808-9361

*Contact\_Voice\_Telephone:* 406-829-6957

*Metadata\_Standard\_Name:* FGDC Biological Data Profile of the Content Standard for Digital Geospatial Metadata

*Metadata\_Standard\_Version:* FGDC-STD-001.1-1999

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## Metadata: D-236 (Anderson)

- [Identification Information](#)
- [Metadata Reference Information](#)

---

### Identification Information:

*Citation:*

*Citation Information:*

*Originator:* Anderson, Hal et al.

*Publication Date:* Unpublished material

*Title:* Hal Anderson Collection

*Geospatial Data Presentation Form:* database

*Series Information:*

*Series Name:* D-236, Fire Sciences Archives

*Issue Identification:*

*Description:*

*Abstract:*

Collection of Hal Anderson's papers, reports, and photographs. D-236 includes files on Ball Instrumentation and operation; fuel moisture data (1988-89); Lubrecht management objectives (bark beetles, c. 1976); an overhead presentation on crown fires in the Northern Rockies; fuel model descriptions (1980) and Anderson fuel model paper drafts (1979); and fuel model example photos (288 scans) with notes when available. Scans available here;

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Anderson

*Purpose:*

Preservation of research notes, data, and photo documentation, fire physics, fire behavior, and other research.

*Supplemental Information:*

For access to scanned photographs and other data, contact Kris Lee (kristinelee@fs.fed.us) or Diane Smith (dianemsmith@fs.fed.us).

*Time Period of Content:*

*Time Period Information:*

*Range of Dates/Times:*

*Beginning Date:* Unknown

*Ending Date:* Unknown

*Currentness Reference:*

ground condition

*Status:*

*Progress:* Planned

*Maintenance and Update Frequency:* As needed

*Keywords:*

*Theme:*

*Theme Keyword Thesaurus:* None

*Theme Keyword:* Ball Instrumentation, fuel models, crown fires, Hal Anderson, Missoula Fire Sciences Lab

*Access Constraints:* None

*Use Constraints:*

None

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*Metadata\_Reference\_Information:*

*Metadata\_Date:* 20130206

*Metadata\_Contact:*

*Contact\_Information:*

*Contact\_Person\_Primary:*

*Contact\_Person:* Diane Smith

*Contact\_Organization:* Missoula Fire Sciences Laboratory

*Contact\_Address:*

*Address\_Type:* mailing and physical

*Address:* 5775 W US Highway 10

*City:* Missoula

*State\_or\_Province:* MT

*Postal\_Code:* 59808-9361

*Contact\_Voice\_Telephone:* 406-829-6957

*Metadata\_Standard\_Name:* FGDC Biological Data Profile of the Content Standard for Digital Geospatial Metadata

*Metadata\_Standard\_Version:* FGDC-STD-001.1-1999

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## Metadata: D-238 (Anderson)

- [Identification Information](#)
- [Metadata Reference Information](#)

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### Identification Information:

*Citation:*

*Citation Information:*

*Originator:* Anderson, Hal

*Publication Date:* Unpublished material

*Title:* Hal Anderson Collection

*Geospatial Data Presentation Form:* database

*Series Information:*

*Series Name:* D-238, Fire Sciences Archives

*Issue Identification:*

*Description:*

*Abstract:*

Collection of Hal Anderson's research, papers, reports, and photographs. D-238 includes three large-fuel studies data and slides and Polaroid photos documenting the test runs. NOTE that these records have been water damaged. Scans available here for 1983:

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Anderson\BoxD238\LgFuelStudy\_1983--3T17-1\_3T17-2\_3T17-3 For 1985

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Anderson\BoxD238\LgFuelStudy\_1985\_PP-7\_PP-8\_PP-9\_PP-10\_DF-5-1\_DF-5-2 For 1986

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Anderson\BoxD238\LgFuelStudy\_1986\_PP-13

*Purpose:*

Preservation of research notes and photo documentation of early fire behavior research, development of fuel models, and other research.

*Supplemental Information:*

For access to scanned photographs and other data, contact Kris Lee (kristinelee@fs.fed.us) or Diane Smith (dianemsmith@fs.fed.us).

*Time Period of Content:*

*Time Period Information:*

*Range of Dates/Times:*

*Beginning Date:* Unknown

*Ending Date:* Unknown

*Currentness Reference:*

ground condition

*Status:*

*Progress:* Planned

*Maintenance and Update Frequency:* As needed

*Keywords:*

*Theme:*

*Theme Keyword Thesaurus:* None

*Theme Keyword:* fuel models, large fuel studies, Hal Anderson, Missoula Fire Sciences Lab

*Access Constraints:* None

*Use Constraints:*

None

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*Metadata\_Reference\_Information:*

*Metadata\_Date:* 20130207

*Metadata\_Contact:*

*Contact\_Information:*

*Contact\_Person\_Primary:*

*Contact\_Person:* Diane Smith

*Contact\_Organization:* Missoula Fire Sciences Lab

*Contact\_Address:*

*Address\_Type:* mailing and physical

*Address:* 5775 W US Highway 10

*City:* Missoula

*State\_or\_Province:* MT

*Postal\_Code:* 59808-9361

*Contact\_Voice\_Telephone:* 406-829-6957

*Metadata\_Standard\_Name:* FGDC Biological Data Profile of the Content Standard for Digital Geospatial Metadata

*Metadata\_Standard\_Version:* FGDC-STD-001.1-1999

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## Metadata: D-241

- [Identification Information](#)
- [Metadata Reference Information](#)

---

### *Identification Information:*

*Citation:*

*Citation Information:*

*Originator:* Anderson, Hal

*Publication Date:* Unpublished material

*Title:* Hal Anderson Collection

*Geospatial Data Presentation Form:* database

*Series Information:*

*Series Name:* D-241, Fire Sciences Archives

*Issue Identification:*

*Description:*

*Abstract:*

Collection of Hal Anderson's research, papers, reports, and photographs. D-241 contains two binders of slides documenting a 1985 burn out study and three large data printouts from 1989 stored with other legal-sized documents on shelves. Slide scans from 1985 are available here:

O:\RD\RMRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Anderson\BoxD241\_BurnOut\_Study1985

*Purpose:*

Preservation of notes and photo documentation of early fire behavior research, development of fuel models, and other research.

*Supplemental Information:*

For access to scanned photographs and other data, contact Kris Lee (kristinelee@fs.fed.us) or Diane Smith (dianemsmith@fs.fed.us).

*Time Period of Content:*

*Time Period Information:*

*Range of Dates/Times:*

*Beginning Date:* Unknown

*Ending Date:* Unknown

*Currentness Reference:*

ground condition

*Status:*

*Progress:* Planned

*Maintenance and Update Frequency:* As needed

*Keywords:*

*Theme:*

*Theme Keyword Thesaurus:* None

*Theme Keyword:* burn out research, Hal Anderson, Missoula Fire Sciences Lab

*Access Constraints:* None

*Use Constraints:*

None

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*Metadata\_Reference\_Information:*

*Metadata\_Date:* 20130207

*Metadata\_Contact:*

*Contact\_Information:*

*Contact\_Person\_Primary:*

*Contact\_Person:* Diane Smith

*Contact\_Organization:* Missoula Fire Sciences Lab

*Contact\_Address:*

*Address\_Type:* mailing and physical

*Address:* 5775 W US Highway 10

*City:* Missoula

*State\_or\_Province:* MT

*Postal\_Code:* 59808-9361

*Contact\_Voice\_Telephone:* 406-829-6957

*Metadata\_Standard\_Name:* FGDC Biological Data Profile of the Content Standard for Digital Geospatial Metadata

*Metadata\_Standard\_Version:* FGDC-STD-001.1-1999

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## Metadata: D-242 (Anderson)

- [Identification Information](#)
- [Metadata Reference Information](#)

---

### *Identification Information:*

*Citation:*

*Citation Information:*

*Originator:* Anderson, Hal

*Publication Date:* Unpublished material

*Title:* Hal Anderson Collection

*Geospatial Data Presentation Form:* database

*Series Information:*

*Series Name:* D-242, Fire Sciences Archives

*Issue Identification:*

*Description:*

*Abstract:*

Collection of Hal Anderson's research, papers, reports, and photographs. D-242 includes four binders of slides (stored on archives shelves) of burn out studies from 1982-1986. Also includes reports, printouts, and Polaroids (not yet scanned) of 5 tests in 1985. D-242 also includes a report from a national fire behavior research conference from 1980, and an overview of a power arc control system, including Polaroids (not scanned). Scans of burn out study slides available at: O:\RD\R

MRS\Science\FFS\Projects\ScienceSynthesisandDelivery\TTT\History\Archive\_project\Anderson\Box D242\_BurnoutStudy\_4\_binders\_1982

*Purpose:*

Preservation of research notes and photo documentation of early fire behavior research, development of fuel models, and other research.

*Supplemental Information:*

For access to scanned photographs and other data, contact Kris Lee (kristinelee@fs.fed.us) or Diane Smith (dianemsmith@fs.fed.us).

*Time Period of Content:*

*Time Period Information:*

*Range of Dates/Times:*

*Beginning Date:* Unknown

*Ending Date:* Unknown

*Currentness Reference:*

ground condition

*Status:*

*Progress:* Planned

*Maintenance and Update Frequency:* As needed

*Keywords:*

*Theme:*

*Theme Keyword Thesaurus:* None

*Theme Keyword:* burn out studies, Hal Anderson, Missoula Fire Sciences Lab

*Access Constraints:* None

*Use Constraints:*

None

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*Metadata\_Reference\_Information:*

*Metadata\_Date:* 20130207

*Metadata\_Contact:*

*Contact\_Information:*

*Contact\_Person\_Primary:*

*Contact\_Person:* Diane Smith

*Contact\_Address:*

*Address\_Type:* mailing and physical

*Address:* 5775 W US Highway 10

*City:* Missoula

*State\_or\_Province:* MT

*Postal\_Code:* 59808-9361

*Contact\_Voice\_Telephone:* 406-829-6957

*Metadata\_Standard\_Name:* FGDC Biological Data Profile of the Content Standard for Digital Geospatial  
Metadata

*Metadata\_Standard\_Version:* FGDC-STD-001.1-1999

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